

Physical and Aesthetic Properties of Fused Recycled Bottle Glass

This paper is about the results of a systematic investigation into the material properties of fused recycled bottle glass. At the beginning it was recognised that recycled bottle glass was being used in applications such as aggregate, filter-beds and some novel tiles. This limited range of applications and the lack of published data on factors such as sourcing, fusion methods and strength, led to the rationale for this project. The rationale was to explore systematically the variation of parameters such as grain size, frit colouring, fusion temperatures and fabrication methods in order to be able to predict aesthetic and physical properties of the fused material. As a consequence, this provided data upon which a rational choice of fused recycled bottle glass could be made for specific applications.

The research concludes through a major case study. Interior tiles were developed and produced to an architect's specification and installed in a show apartment, which is being used to market low cost sustainable housing for a new development in Swansea. In conjunction with the major case study, which also included the creation of a sculptured artefact, robustness test of the interior tiles were conducted in line with the commissioning architect's specifications. The purpose of the case study was twofold. First, to show that it is possible to reproduce, in a predictable way, the properties of the material to meet the requirements of the commercial client. Secondly, to establish if the use of recycled glass in any way affects subjective opinions about the aesthetic and physical properties of the material. This was investigated through the use of a questionnaire.